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AUTHOR Kealy, Ronald P.; Witmer, Kenneth D., Jr.
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ABSTRACT

This paper presents an alternative instructional strategy, cooperative learning, and argues that it can help to address the recognized need for greater student participation in learning at the higher education level. Cooperative learning is presented as a complement to the traditional lecture/discussion format. The method is described as encouraging students to work together on structured learning tasks which can follow the presentation of information by the instructor or be used periodically during a presentation to allow time for students to process the content presented. Elements of cooperative learning are presented including positive interdependence, individual accountability, and social skill development. An examination of the research related to this method looks at its effect on academic achievement, higher level thinking skills, social interaction, and positive attitudinal responses. A concluding section on implementation advocates that college instructors consider adding cooperative learning to their teaching repertoire beginning with some background reading in the area, and selection of a simple structure to try before moving on to more complex activities. The paper also notes the usefulness of establishing teams within the class from the beginning of the course for efficient integration of cooperative activities. Included are 20 references. (JB)

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COOPERATIVE LEARNING IN HIGHER EDUCATION:
An Alternative Approach to Collegiate Instruction.

Drs. Ronald P. Kealy and Kenneth D. Witmer, Jr.
Department of Educational Professions
Frostburg State University

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Introduction

A continuing concern of many college and university instructors, as well as critics of the higher education experience, is the lack of students' active participation in the learning process. We regularly hear our colleagues lament the passivity of their classroom clientele, applying such descriptors as unmotivated, apathetic, and uninterested. This concern has been voiced regularly at Frostburg State University, and has resulted in the inclusion of a major goal in our mission statement:

> Promotes initiatives which enhance students' active involvement in learning and their desire for continued intellectual development.

Several contemporary reports of the status of higher education include criticisms of our failure to stimulate active student participation in the learning process. (National Institute of Education 1984, Association of American Colleges 1985, Bok 1986, Boyer 1987). In addition to the concern that passive learning does not develop higher order thinking skills and problem solving abilities, our heavy reliance on direct teaching generally does not prepare our students for an increasingly collaborative work force. As they implement more collaborative management systems, business and industry are increasingly interested in selecting employees who can work together effectively to produce products, solve problems, and initiate alternatives.

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In spite of these expressed concerns, the traditional lecture/discussion continues as the predominant and pervasive instructional strategy in our colleges and universities. If it is a truism that teachers teach as they have been taught, then it is not surprising that the lecture/discussion method is used so widely. For most of us, lecture/discussion represents the vast majority of our educational experience.

In a recent survey of the research of college teaching McKeachie concludes:

> Our survey of teaching methods suggests that ... if we want students to become more effective in meaningful learning and thinking, they need to spend more time in active, meaningful learning and thinking -- not just sitting and passively receiving information. (1986)

We need to explore alternative teaching methods if we want our students to be more actively involved in the learning process.

Our purpose in this paper is to present an alternative instructional strategy, not to replace lecture/discussion, but to complement it. Cooperative learning has emerged as a well-researched, successfully implemented instructional strategy, primarily at the precollegiate level. More recently it has made some inroads at the higher education level, resulting in its inclusion in the literature on teaching at the collegiate level, as workshops at various conferences, and in at least one professional organization devoted solely to its effective implementation as an alternative method of college instruction.

What is Cooperative Learning?

Simply stated, cooperative learning is an instructional method in which students work together on structured learning tasks. It has been identified by other names, including collaborative learning, student team learning, and we have coined yet another - proactive learning. We prefer this term because it can be applied to all strategies used to elicit active student

involvement in learning whereas cooperative learning connotes specific types of strategies or programs to some. However, since cooperative learning is the most commonly used term, we will use it in this paper. The recent evolution and successful implementation of cooperative learning result largely from the work of Robert Slavin at Johns Hopkins University, David and Roger Johnson at the University of Minnesota, and Spencer Kagan at the University of California. Each represents different "camps" which promote slightly different perspectives, organization, and emphases. Slavin has promoted the development of comprehensive curriculum packages for specific subject areas; Johnson and Johnson tend to focus on the development of cooperative skills; and Kagan employs a "structures" approach whereby instructors learn individual cooperative learning structures which can be employed in any subject areas. We believe that Kagan's approach is the most practical at the college level, primarily because of its flexibility. Most cooperative learning structures can be employed in any subject area, and the instructor can determine the extent to which cooperative learning is used.

Many of us have used strategies in which students work together - on projects, in laboratory stations, in group discussions, athletic teams, etc. The distinctions between these efforts and the more recent efforts are the increased systematic application of learning theory in the development of the methodologies, and the high degree of structure of the methodologies. For example, a very simple cooperative learning strategy, called think-pair-share, employs what we know about cognitive processing in a three-step activity. First, the student thinks about a question or problem or issue for a specified time period. Second, the students thoughts are communicated to a partner, again in a clearly specified time period. And finally, several students are asked to share the thoughts of their partners with the entire class. This simple strategy motivates

all student to think about the topic because their thoughts must be communicated to another student. They must listen carefully to their partners, for they may be asked to communicate what they hear. Such active participation is much more apt to result in learning and retention than the passive receipt of information. The strategy can follow the presentation of information by the instructor, or be used periodically during a presentation to allow time for the students to process the content presented.

Elements of Cooperative Learning

Effective cooperative learning employs the concept of positive interdependence - the notion that each student must contribute if the task is to be successfully achieved. Simply placing students in groups to achieve a task without a planned structure may well result in a small number of workers and a large number of "hitchhikers". A planned structure to ensure participation of all is a prerequisite to effective cooperative learning. In addition to this powerful notion of positive interdependence, the individual accountability of each student must be maintained. Ultimately, each student must demonstrate what has been learned as a result of the instructional strategy employed on tests, papers, or other traditional means of assessing individual achievement. There may be recognition for group achievement, but individuals earn their own grades. A third important element of cooperative learning is social skill development. This is achieved through careful grouping of students, structured student interaction, consensus building, and processing of group activities. A description of a slightly more complex structure called Jigsaw demonstrates these important elements: positive interdependence, individual accountability, and social skill development.

In Jigsaw, a topic or issue is divided into component parts. Within the cooperative learning teams, each team member is assigned one of the components. Those team members who have been assigned the same component reconvene in "expert groups" to study

together and become "experts" in their assigned area of expertise. Before they return to their base teams, everyone in the expert group demonstrates their expertise to the others. Upon returning to the base team, team members take turns teaching what they have learned. Later, the class is tested on the whole topic. In an education class, for example, to gain an understanding of basic educational philosophies, each team member can be assigned to one of the basic philosophies and join an expert group to study materials provided by the instructor. After returning to the base team and teaching their assigned philosophy to the others, the team chooses their preferred philosophy or identifies elements of each that appeals to them in a consensus building activity. This can also lead to the development of personal philosophy statements. Roles can be assigned in each of the groups, and random selection of students to report for their groups can provide added incentive for active participation. At the end of the activity, processing of group performance and individual performance within groups promotes the development of social skills. Individual accountability is accomplished by a test and, if the instructor chooses to do so, team performance can be recognized by using by averaging test scores of team members. Positive interdependence, or contribution of each team member is virtually guaranteed in this structure because each has a specifically assigned task. We all know that you must really understand something when you have to teach it to someone -- this notion is practically applied in Jigsaw. And, of course, there is mandatory student interaction and analysis of that interaction as an integral part of this activity. That's Jigsaw -- a very effective cooperative learning structure.

Outcomes of Cooperative Learning

As previously mentioned, there are several camps which offer methods of incorporating cooperative learning within the educational process. Although these distinct approaches may vary somewhat, the outcomes of properly implemented strategies seem to

be consistent. A synthesis of the research related to cooperative learning reveals significant beneficial outcomes in the areas of academic achievement, higher level thinking skills, social interaction, and positive attitudinal responses to instruction by both students and instructors.

Academic Achievement. Most of the supportive research for cooperative learning has been conducted at the pre-collegiate level (Johnson et al.1981, Slavin 1983, Slavin 1990). There is, however, a rapidly growing research base developing at the college level as proactive learning methods become increasingly popular in the college classroom. It is also important to note that many of the findings of current research are not strictly age-related -- similar outcomes can be expected among a broad range of ages with slight alterations in the instructional strategy. Social psychologists have provided evidence since the 1920's that collaborative learning methods will produce positive effects among diverse age groups and differing populations. (Slavin 1977)

The most valued outcome of cooperative learning, and the one most extensively researched at this point, is the enhancement of academic achievement. When appropriately implemented, cooperative learning methodologies can significantly accelerate student learning (content acquisition). In a review of 67 studies conducted by the Center for Research on Elementary and Middle Schools at Johns Hopkins University, analysts found that 72% of the studies provided evidence that cooperative learning methods had a positive effect on the achievement of students as compared to students experiencing traditional methodologies. In most of the remaining 28% of the studies, there was no significant difference in achievement levels. (Slavin 1990) In other words, if it did not help, at least the approach did not inhibit the academic progress of the subjects. Generally, the findings were very positive for the methodologies related to collaborative learning.

The Center's findings proved to be consistent with those summarized in a meta-analysis of the effectiveness of cooperative learning conducted by Johnson, Maruyama, Johnson, Nelson, and Skon (1981). This analysis revealed that cooperative learning produced large gains in academic achievement when compared to more traditional teaching practices. It is important to note that this meta-analysis included studies involving collegiate and adult learners as well as K-12 students.

At the college level, James Cooper of California State University has been studying the effectiveness of cooperative learning in his college classes. (Cooper 1989) Cooper's most recent research indicated a positive trend in the academic performance and student attitudes toward academic performance that was commensurate with the increased use of cooperative learning methods over several semesters. Although the population was small, Cooper feels certain that collaborative methodologies significantly influenced the academic progress of the students. Other studies which have examined the effectiveness of cooperative and found that it produced notable enhancement of academic achievement at the collegiate level were conducted by Dansereau (1985), Treisman (1985), and Freisan (1986).

Overall, cooperative learning has made a significant impact on improving the academic achievement of students from kindergarten age to adulthood. This methodology has potential for even greater academic gains as we become increasingly adept at implementing the strategies effectively.

Higher Order Thinking. Higher level thinking skills, an area closely related to academic achievement and of particular interest to college instructors, is another dimension of the learning process that has been positively affected by cooperative learning techniques. As pointed out by Slavin (1983), developmental theory suggests that interaction among learners of all ages increases the individual's mastery and development of critical concepts. A specific example which reflects this principle

is presented by Vygotsky (1978) who notes: "Research shows that reflection is spawned from argument." We all know that "it takes two to tango" at a meaningful level. Research shows that student-to-student and student-to-instructor interaction incorporated within the cooperative learning approach assists in moving the handling of subject matter from lower levels of learning to higher levels (Johnson and Johnson 1986, Sharan 1988, Slavin 1990).

Cooperative learning requires all students to be actively involved with the course content and the learning process. Educational psychology research indicates that the more students "act" on the information they are presented, the more they must mentally manipulate this information (cognitive elaboration). (Epstein 1980) The more students cognitively deal with the information, the more likely it is that the information will be related to previous learning and become part of the knowledge base and conceptual understandings of the students. Such mental restructuring is prerequisite to higher level thinking.

The results of Cooper's research review of cooperative learning in the college classroom were consistent with developmental research. Students in Cooper's study indicated that cooperative learning methods required higher levels of thinking as compared to the traditional lecture or lecture-discussion method. Likewise, John Cuseo (1990) found that cooperative learning techniques resulted in "high-order" thinking within his college classes and noted: "By carefully selecting the process and content of the cooperative learning task, the instructor can assure that students' covert and overt cognitive activities are focused on higher order thinking skills such as application, evaluation, and synthesis."

From our own experience as college instructors, we have observed students demonstrate extremely sophisticated levels of thinking within the interactive process provided by the application of cooperative learning methods. Responsses to questions

and problems requiring in-depth thought are consistently more appropriate when students have had an opportunity to reflect, share, and assist one another in the learning experience.

It follows from what we have gleaned from the research and what we know about the learning process that cooperative learning structures provide not only advanced academic achievement, but stimulate higher levels of thinking about specific subject matter and related concepts -- an outcome of great significance for any institution of higher education.

Interpersonal Skills. Of equal importance to the academic advances produced throughthe cooperative learning approach is the development of social skills that this method produces in the students, according to the research. (Webb 1985) Research that has focused on grades K-12 supports the idea that cooperative learning improves social skills of students within the academic setting and teaches them to work cooperatively with those around them. (Slavin 1990) In response to the question of whether these strategies prepare students to exist in a competitive world, Spencer Kagan is quick to point out that most businesses and industries are looking for people who can interact constructively with their fellow workers. Kagan states: "Given the reality of the job-world, it is incombent on the schools to provide cooperative interdependent experiences in order to provide students with the interpersonal skills they need for positive participation in economic life." (Kagan, 1989)

Of course we are not suggesting that it is the responsibility of the college professor to become obsessed with the social conduct of their students. In fact, we would expect most of the students who have come this far in their academic pursuits are capable of appropriate social behavior. However, as a community of learners we must always strive to promote positive social interaction within the pedagogical framework.

Cooperative learning encourages the natural tendency of college students to want to interact with their peers as evidenced

in the vast numbers of collegiate clubs, sororities, fraternities, sports teams, and social events of all types. Further, this method provides for the constructive, guided development of important social skills that make such interaction effective. By attending to the social responsibilities of our students as members of the academic community, we can encourage them to interact constructively with individuals of diverse abilities, personalities, ethnic backgrounds, and value systems. Through the structured process of positive interdependence, students become more accepting and aware of the benefits of working cooperatively with others as they struggle to grow academically, personally, and socially.

Positive Attitudes. In addition to positively affecting academic achievement and interpersonal relations, cooperative learning has proven to be a welcome approach to learning by both students and teachers. Cooper's study illustrated that the structures of cooperative learning resulted in students becoming more interested in the subject matter, attending class more often, spending more time on task, experiencing more frequent quality interaction with peers and instructors, and feeling more positive about the learning experience (class morale was improved). (Cooper 1989) Most college professors would certainly welcome these general improvements demonstrated by the students in Cooper's classes.

In referring again to our experiences as college instructors, we have found that the systematic implementation of the cooperative learning approach has made the pedagogical experience more exciting and rewarding both scholastically and personally. The structures we have incorporated into our classes are effective in producing the desired academic progress while making the learning process more gratifying and stimulating for all involved.

Implementation

We are not advocating that college instructors replace the

more traditional methods of teaching with cooperative learning strategies, only that they experiment with a few cooperative learning structures to determine the degree to which they can complement their current methods. We agree with Cooper's statement: "College professors should be encouraged to consider adding cooperative learning to their teaching repertoire -- as an instructional option or variation which would serve to complement and augment more tradtional pedagogical methods, rather than to supplant or replace them." Our current use of cooperative learning strategies averages about 35% of total class time and we expect that the percentage will not increase significantly. Further development will focus on the structure and quality of the cooperative learning strategies, not on increased quantity. Instructors must determine the optimum mix of instructional strategies appropriate for their courses.

For those who have not used cooperative learning in their classrooms we suggest that, after a little background reading on this concept, you select a simple structure (such as think-pair-share) to insert at an appropriate point. When you feel comfortable with the simple structure, you may wish to add different structures to your repertoire, moving on to more complex structures and even combinations of cooperative learning structures (multistructures). We caution against using any structure without studying it fully to be sure that the structure is appropriate for your learning objectives, and without developing a detailed, organized plan with a well-establish time schedule. Cooperative learning can be a highly effective and even time-efficient strategy if structured appropriately. It can, like any other strategy, be a disaster if ill-conceived and implemented in a disorganized way.

As we have moved on to more extended use of cooperative learning in our classrooms, we have found it useful to organize the classroom into teams at the very beginning of the semester so that when we do incorporate cooperative learning structures, the

transition is easier and more time-efficient. Students sit near their team members and can quickly move to interact with a partner or the entire team. Also, we use "team-building" activities, especially in the first part of the semester, to promote communication and team cohesiveness. Even a simple activity like deciding on a team name, greeting, and logo can significantly accelerate the team's ability to work together constructively. Our experience is that teams of four are most effective but certainly no less than three or no more than five. Some students tend to "hide" in larger teams, and smaller teams do not typically generate a wide variety of perspectives. Teams of four allow for pair activities within the team. As recommended by experienced cooperative learning instructors, we try to make the teams as heterogenous as possible considering factors such as achievement, location of home, sex, race, and interests. The research indicates that this mix provides for the greatest growth of students with respect to academic achievement, social skills, and attitudes toward others. (Kagan 1989)

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